

PRINTING AND ENLARGING

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A N I L F O R D T E X T B O O K

Printing and Enlarging

Second Edition

ILFORD LIMITED · ILFORD · LONDON

1955



'Reflections' by W. SUSCHITZKY

'Hung at the Royal'

EXHIBITED AT
THE LONDON SALON
OF PHOTOGRAPHY



1954



THE ROYAL : :
PHOTOGRAPHIC
SOCIETY OF : :
GREAT BRITAIN:

ACCEPTED AND
HUNG AT THE
ANNUAL EXHIBITION
LONDON. 1953.

Exhibited at the Salon'

Every year there must be hundreds of prints which fail to gain these distinctions through lack of print quality and unsuitable presentation, and it is to assist aspirants to these honours that this booklet has been written. It is written also for the benefit of those photographers who, though not ambitious for success in Exhibition work, nevertheless desire to achieve the object of most photographic work, namely, the production of a technically perfect print and the presentation of it in the most attractive and suitable manner.

Print perfection and how to achieve it, then, is the object of this booklet. In it we take the worker through the various stages of dark-room procedure, culminating with the presentation of the print for exhibition, decorative, or record purposes, as the case may be.

We are generally assuming that our workers' negatives have been correctly exposed and developed, although we show how, by careful selection of contrast grades, the 'not so good' negative may still be made to give a perfect print.

Finally, if difficulties arise, don't let them stop your progress. Send details and examples where possible to Ilford Limited, whose knowledge and experience are always at your service.

Emulsion Characteristics

Before proceeding to practical work it is advisable to have a working knowledge of the materials you are going to use and to understand their characteristics in order that the final selection of the paper will be appropriate to the negative and to the subject.

There are four types of Ilford development paper in general use. Bromide, Plastika, Multigrade (a variable contrast paper), and Contact, at one time popularly known as 'Gaslight' paper. The first three are made with a speed suitable for enlarging, and the fourth is designed specially for contact printing and made so slow that it can be handled safely in a weak artificial light.

Basically, paper emulsions are similar to negative emulsions, but there are important differences particularly in regard to colour sensitivity, speed, and grain size. These differences and the reasons for them are discussed briefly under their respective headings.

COLOUR SENSITIVITY

Colour sensitivity in the sense in which it is applied to negative materials, is unnecessary in printing papers which are used simply to reproduce the light and shade of a monochrome negative. They are, therefore, generally made sensitive only to the ultra-violet, violet, and blue portions of the spectrum, and so allow of safe handling in the comparatively bright light of orange safelights. Plastika and Multigrade, although somewhat slower in speed than bromide papers, have a slightly higher degree of colour sensitivity and for this reason must be handled in the light given by an Ilford S Safelight, No. 902 (light brown) (the Ilford standard safelight for Bromide Papers) with a 15-watt pearl bulb. Certain other safelights recommended for bromide papers are not safe with Plastika or Multigrade.

With Contact papers the VS2 Safelight, No. 910 (orange) may be used or the paper may be worked in weak artificial light, provided that no direct light falls on the paper.

SPEED

The speed of photographic papers is necessarily much slower than that of negative materials in order that exposures may be accurately timed.

Too fast a paper would result in exposures becoming so short that accurate timing would be impossible. The approximate relative exposures required by Ilford Bromide, Plastika and Contact papers are:

Bromide, 1; Plastika, 2; Contact, 50.

Multigrade is slower than Bromide although the speed is dependent upon the colour of the printing light (see page 28).

GRAIN

Although the grain of paper emulsions is so fine that no question of visible graininess ever arises, it has a determining influence on the quality of the print inasmuch as the grain size to a large extent controls the colour of the image. Because the silver grains which form the image grow bigger as development proceeds, it is essential, if the correct image colour is to be obtained, that the time of development given to any particular paper should not be less than the minimum recommended. Likewise, the composition of the developing solution should be according to the recommended formula.

GRADATION

With a negative emulsion almost any desired contrast can be obtained by giving longer or shorter development. With papers little control of contrast can be obtained in this way. A minimum degree of development is necessary to obtain good image colour and maximum black, and beyond this point increased development yields little increase in contrast. Bromide, Plastika and Contact papers are therefore made in several gradations, and Multigrade changes its contrast according to the colour of the light used for printing, thus making it possible to match the negative contrast and so to prepare satisfactory prints from a very wide variety of negatives.

Types of Development Papers

CONTACT PAPER. The name 'Gaslight' was previously used for this type of paper to denote a material of such sensitivity that the illumination of an ordinary living-room could be used for exposure, and that development could be safely carried out in the same room at a reasonable distance from the light. The name 'Gaslight' has now been replaced by 'Contact' to indicate that the paper is of a speed suitable for contact printing. Ilford Contact Paper is supplied with a glossy

surface, in the gradations listed on page 9. It has a pleasing blue-black image colour.

Contact paper is often referred to as chloride paper, because the chief silver salt in it is silver chloride, although other silver salts may be present in small quantities. In a similar way, the principal silver salt in bromide paper is silver bromide, but silver chloride and iodide may also be present in limited quantities.

BROMIDE PAPER is the fastest type of development paper, with a speed about fifty times that of Contact paper, which makes it the most suitable paper for enlarging and for the rapid production of prints by contact. It must be handled and processed by a brown light, and this necessitates the provision of a room from which all daylight can be excluded – the illumination being provided by a properly designed darkroom lamp, used in conjunction with an Ilford S Safelight, No. 902 (light brown).

Bromide papers give prints of a fine black colour by direct development, and should always be developed for at least $1\frac{1}{2}$ to 2 minutes at 68°F. (20°C.). Ilford Bromide Papers are made on single and double weight bases, and in gradations and surfaces to satisfy every requirement and taste.

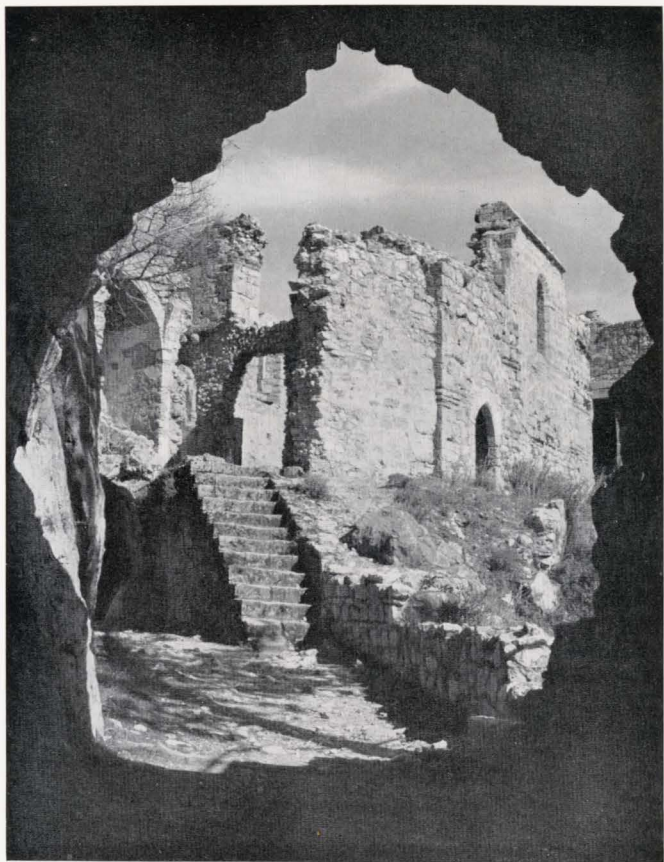
PLASTIKA is a warm-black development paper with a speed approximately half that of Bromide paper. The chief characteristic of Plastika is its extraordinarily long scale of gradation from which it derives its ability to reproduce accurately every tone in the negative. Prints on Plastika have a depth and richness of colour which make them outstandingly distinctive.

Plastika is handled in exactly the same way as Bromide paper and it is essential that the same safelight, *i.e.* Ilford S, No. 902 (light brown), be used.

With correct exposure the image will begin to appear in from 15 to 25 seconds, with full detail coming up in 35 to 45 seconds, after which the darker portions and shadows gradually build up with continued development giving maximum quality in from $1\frac{1}{2}$ to 2 minutes at a temperature of 68°F. (20°C.).

Plastika is made in a variety of lovely surfaces and in three gradations, Soft, Normal and Hard.

MULTIGRADE PAPER provides the means of enlarging all types of negatives, hard or soft, thin or dense, from one box of paper. When you buy Multigrade you choose the surface without worrying about the contrast grade; the paper itself contains the key to the problem of contrast. The explanation is that Multigrade Paper changes its



Photograph by F/LT. I. MATHESON

contrast according to the colour of the light used for printing – the more yellow the light the harder the print. Thus a single box of Multigrade Paper with a range of three yellow filters of increasing depth, provides the equivalent of four well-spaced contrast grades.

Multigrade, which gives prints of pleasing neutral-black tone, is handled in a similar way to Bromide paper, full details of darkroom lighting, processing, etc., will be found on page 25.

Multigrade is supplied in two surfaces, Glossy and Velvet Stipple. Glossy is supplied in single weight and double weight, Velvet Stipple in double weight only.

Surfaces and Gradations

The function of a photographic paper is not only to reproduce the tone gradations of a negative, but also to express the character of the subject. Ilford Papers are manufactured in a wide variety of distinctive surfaces in order that the photographer may select the one which will most adequately produce the effect which he desires. The following is a list of the surfaces and gradations, and specimen prints on the various surfaces are enclosed in the pocket at the back of this booklet.

ILFORD BROMIDE PAPER

					<i>Contrast Grades</i>			
					²	³	⁴	
<i>Surface</i>					<i>Weight</i>	<i>Normal</i>	<i>Hard</i>	<i>Extra Hard</i>
Glossy				SW	B2. 1P	B3. 1P	B4. 1P	
				DW	B2. 1K	B3. 1K	B4. 1K	
Semi Matt				DW	B2.24K	B3.24K	B4.24K	
Velvet Stipple				SW	B2.26P	B3.26P	B4.26P	
				DW	B2.26K	B3.26K	B4.26K	
Rough Lustre				DW	B2.33K	B3.33K	—	

ILFORD PLASTIKA PAPER

					<i>Contrast Grades</i>		
<i>Surface</i>					<i>1 Soft</i>	<i>2 Normal</i>	<i>3 Hard</i>
White Glossy	SW	A.1	A.2	A.3	A.1K	A.2K	A.3K
White Stipple	DW	E.1K	E.2K	E.3K	F.1K	F.2K	F.3K
Grained Half Matt	DW	G.1K	G.2K	G.3K	T.1K	T.2K	T.3K
White Rayon	DW	T.1K	T.2K	T.3K			
Cream Grained Half Matt ..	DW						

ILFORD MULTIGRADE PAPER

Glossy .. Single weight (MG.1P) and double weight (MG.1K)
 Velvet Stipple Double weight (MG.26K)

ILFORD CONTACT PAPER

					<i>Contrast Grades</i>		
<i>Surface</i>					<i>1 Soft</i>	<i>2 Normal</i>	<i>3 Hard</i>
Glossy	SW	C1.1P	C2.1P	C3.1P			

The availability of papers is subject to change.



Contact Printing with Ilford Papers

Contact printing is the process of making positive prints the same size as the negative, the sensitised paper being held in contact with the negative in a printing frame during exposure. Contact printing is a simple operation requiring the minimum equipment, but it is essential to have a thorough understanding of the process before proceeding to projection printing, or what is more commonly called enlarging. The fundamental principles are the same for both, so that knowledge of the one process will be helpful when dealing with the other.

The essential equipment for contact printing consists of a printing frame, three dishes, and a safelight. Non-essential but extremely useful equipment are a graduated measure, thermometer, and seconds clock.

PRINTING FRAME. Wooden or metal frames as illustrated are available in all the usual negative sizes. They are made in two pieces, the front portion forming a frame for the negative and the back hinged and fitted with a fastener which clamps it into position and ensures perfect contact of paper with negative.

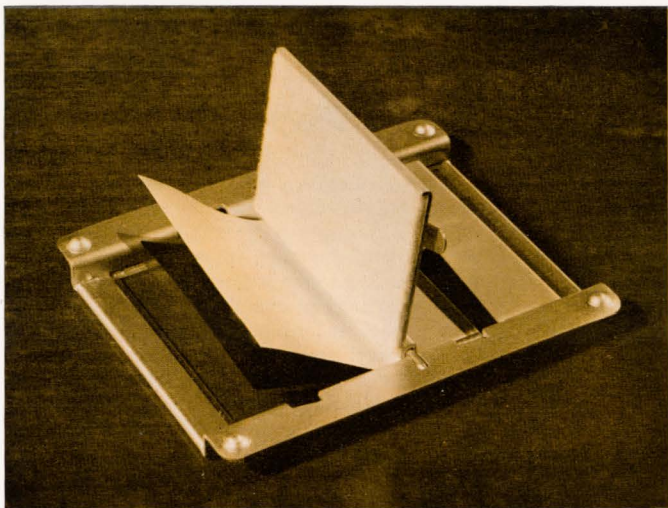
The illustration shows how the frame is loaded with the emulsion side of the film in contact with the emulsion side of the paper.

DISHES. For developer, fixer and rinsing water. The size will depend on the dimensions of the print and the number to be handled at one time. Always use dishes sufficiently big to avoid overcrowding, and keep them for the same solutions. Overcrowding and contamination are frequent causes of stains, which will be avoided by following the above advice.

SAFELIGHTS. For Contact paper Ilford VS2, No. 910 (orange). Contact paper may be handled in artificial light if reasonable precautions are taken to prevent fogging, but it is safer to use a VS2 safelight (with a 40-watt lamp), which gives a bright orange light, when loading the printing frame and during developing and fixing.

In the absence of a safelight, loading the printing frame and development should be carried out at a distance of not less than six feet from the room light and preferably in the shadow of the body or behind a screen.

For Bromide and Plastika papers, Ilford S, No. 902 (light brown). This safelight, with a 15-watt metal filament lamp, will give the maximum amount of safe light.



Printing frame showing the negative and paper in position.

GRADUATED MEASURE. Not essential, but an extremely useful accessory for accurately measuring solutions.

THERMOMETER. For consistently good work solutions must be kept at the same temperature, which may be verified by the use of a thermometer.

SECONDS CLOCK. Particularly useful when a number of prints are to be made from the same negative, thus guaranteeing consistent exposure and development.

SUITING THE PAPER TO THE NEGATIVE

Perhaps the most important factor affecting print quality is the selection of the correct grade of paper to match the particular negative. Whilst this is largely a matter of experience, the following notes and a study of the illustrations on pages 26 and 27 should quickly enable the worker to judge the quality of his negatives and select the grade accordingly.

The contrast of a negative is controlled in the main by the time of development, but with prints in which the silver deposit is something to be looked *at* and not *through*, the case is different. The contrast of a print from a given negative, provided exposure is correct, is determined by the character of the printing paper. It is for the purpose of obtaining

satisfactory prints from negatives of varying degrees of contrast that Ilford Contact, Bromide, and Plastika Papers are made in the gradations listed on pages 8 and 9.

DETERMINING EXPOSURE TIME

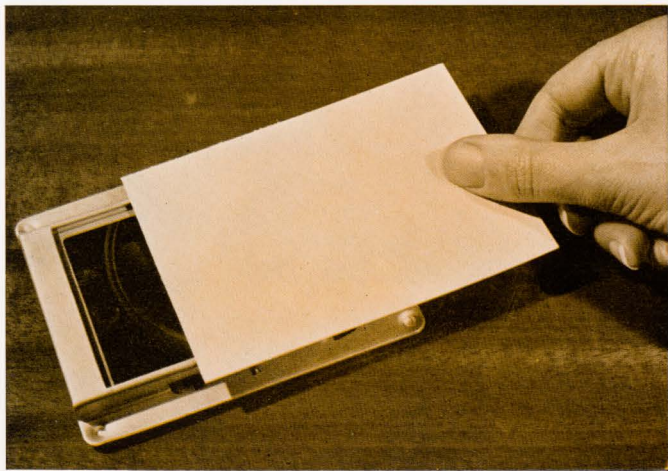
The time of exposure depends on four factors, namely:

1. Strength of the printing light.
2. Distance between light and printing frame.
3. Density or 'blackness' of the negative.
4. Type and contrast of paper.

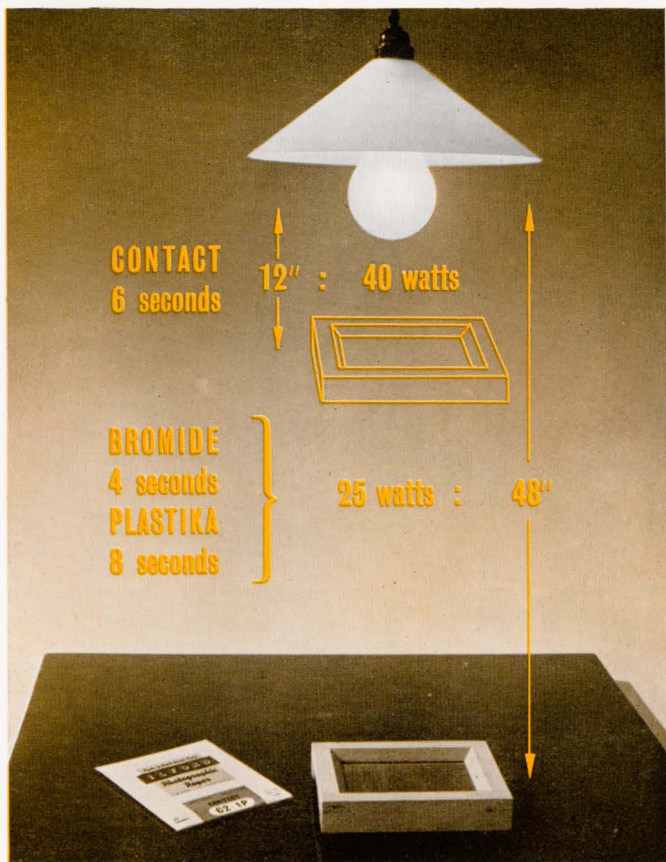
The first two can and must be kept constant. The third factor necessitates individual judgment of negative quality. The illustrations of various types of negatives on pages 26 and 27 and the accompanying details will be of great assistance in matching paper and negative.

Number four can be easily dealt with when the speed relationship of the three types of papers generally used is known. Ilford Bromide paper is approximately twice as fast as the corresponding grade of Plastika and 50 times as fast as the corresponding grade of Contact paper.

We now have to find the exposure time for Bromide and for a normal negative on Normal paper this can be taken roughly as 4 seconds at 48 inches from a 25-watt lamp. Plastika, then, will require 8 seconds and Contact paper 200 seconds or just over $3\frac{1}{4}$ minutes, but to compensate for the relative slowness of Contact paper a stronger light is



Making a test strip to determine correct exposure. An example appears on page 22.



CONTACT PAPER

6 seconds at 12 inches from 40-watt lamp.

BROMIDE PAPER

4 seconds at 48 inches from 25-watt lamp.

PLASTIKA PAPER

8 seconds at 48 inches from 25-watt lamp.

recommended with the distance between the negative and the exposing light reduced from 48 to 12 inches.

An approximate exposure guide for the three types of paper is given and shown diagrammatically on page 14.

It should be noted that Hard grades require slightly more exposure than normal, and the Soft grades a little less.

When in doubt it is an excellent plan to make a test strip by exposing in progressive steps a sheet of the paper, say, for 2, 4, 8, and 16 seconds. Develop fully, and according to the density of the various steps the exposure time can be fairly accurately gauged. (See illustrations at the foot of pages 13 and 22.)

DEVELOPMENT

CONTACT PAPER. Recommended developers PFP and PQ Universal. (See page 50.)

Use an ample quantity of developer, into which slide the print, face upwards. Keep the print in motion by turning it over completely or by rocking the dish continuously. Development should be complete in 45–60 seconds at 68°F. (20°C.), but such is the latitude of the paper that development time can be varied to compensate for under- or over-exposure, of course, within reasonable limits if the best quality results are to be obtained.

BROMIDE PAPER. Recommended developers PFP and PQ Universal. (See page 50.)

Immerse the paper and keep moving as described above for Contact paper. If exposure has been correct the image will begin to appear in 20 to 30 seconds, gradually building up in strength until maximum quality is reached in 1½ to 2 minutes at 68°F. (20°C.). When development is complete the print should appear slightly darker by the dark-room light than it is required to be when finished. The quality of the print depends on correct exposure, and development for the correct time in a suitable developer.

PLASTIKA PAPER. Recommended developers PFP and PQ Universal. (See page 50.)

Plastika is developed in exactly the same way as Bromide Paper, and if exposure has been correct the image will appear in about 15–20 seconds. Full detail appears in 35–45 seconds, after which the darker portions gradually build up until maximum quality is reached in 1½–2 minutes with a developer temperature of 68°F. (20°C.)

RINSING BEFORE FIXING

Immediately development is complete prints are transferred to a dish of clean water and rinsed for a few seconds before placing them in the

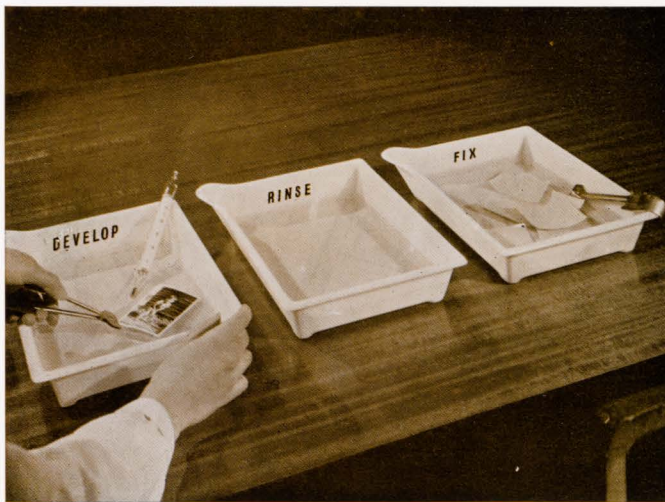
fixing solution. The unfixed prints must not be unduly exposed to air otherwise staining will inevitably result.

FIXING. Recommended fixers IF-2 and Hypam. (See page 50.)

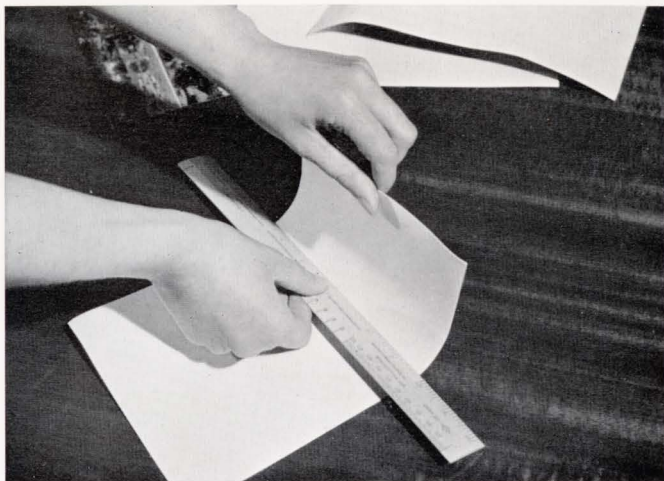
Use a fresh bath for each occasion and keep the prints moving in the early stages of fixing. Prints must not be allowed to stick together nor to float face upwards on the top of the solution. It should be remembered that the life of the print is dependent on thorough fixing and washing so it is essential that these operations are carefully carried out.

WASHING PRINTS

Place the prints one by one in a large dish of clean water, allowing them to soak for five minutes. Remove them, singly, to a second dish of water and repeat the process six to eight times. The prints must not be allowed to pile up or stick together if every trace of fixer is to be removed and permanence and freedom from discolouration ensured. Washing in running water for half an hour is equally satisfactory, but here also precautions are necessary to prevent the prints sticking together.



Showing the arrangement of developing, rinsing, and fixing dishes.



Method of removing curl from prints with a straight-edge.

DRYING PRINTS

When thoroughly washed, place the prints face upwards on a piece of thick glass, squeegee out all the water and rub over the surface with a piece of soft linen or chamois leather. A final rinse in water containing Ilford Wetting Agent (1 part in 500) will result in quicker drying and freedom from tear markings. Then hang up on a line to dry, preferably where dust specks cannot settle on them. Failing a line being handy lay the prints face upwards on blotters. Prints may curl a little on drying but they can be straightened quite simply by drawing a straight edge across them—the backs, of course, to avoid damage to the surface.

GLAZING PRINTS

The glossy surfaces of all Ilford papers are sufficiently glossy for most purposes, but a higher gloss can be obtained by using the electrically heated Ilford Amateur Glazer. In this machine a heating element dries the prints quickly, with a very high gloss.

The chromium-plated glazing sheet is thoroughly cleaned and a little glazing solution rubbed all over the surface. The wet prints are then placed on the sheet and squeegeed, preferably under a waterproof cloth. The glazing sheet is then placed on the machine, and in a short time the glazed dry prints can be peeled-off.



The Ilford Amateur Glazer with glazing sheet in position.

SPOTTING THE PRINT

A spotty print is unsightly and no photographer worthy of the name should be satisfied with a print which is degraded in this way. Spots or markings on a print may have their origin in dust on the negative, or may arise in processing. Again, they may be due to chemical dust settling on the unexposed paper. Whatever the cause they should be avoided or, failing this, removed by 'spotting'. (See *Preparing the Negative for Printing and Finishing the Enlargement*, pages 20 and 23.)

As a preventive, dust the negative before printing with a soft brush or cloth and keep all apparatus spotlessly clean. Use developing, fixing, and washing dishes always for the same purpose and make up solutions away from the room where printing is to be done.

Enlarging with Ilford Papers

The only difference between enlarging and contact printing is the method of exposing. As we have seen in the previous chapter, contact printing requires the sensitised paper to be in contact with the negative, whilst in enlarging, the paper is placed at a distance from the negative behind which is the exposing light and in front the lens which projects the image on to the paper.

ENLARGER

Enlargers are of two types – horizontal and vertical. The first projects the image horizontally on to an easel holding the sensitised paper, and the second projects the image downwards on to a flat bed on which the paper is placed.

It is not proposed to discuss the merits of the types of enlargers or their optical and light systems, as these matters are adequately dealt with in the *Ilford Manual of Photography*, to which the reader is invited to refer.

NEGATIVE CARRIER

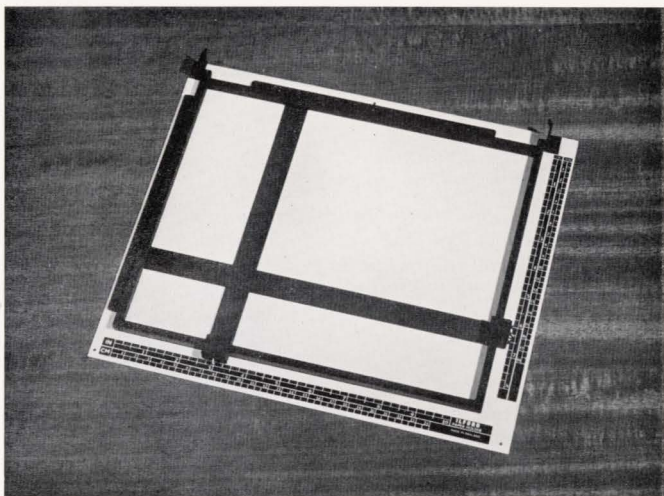
Modern enlargers are fitted with carriers to hold negatives of various sizes, and care should be taken when using a negative smaller than the carrier to use a mask to exclude extraneous light. Failure to do this may result in a general flattening of the quality of the print. When film negatives are 'sandwiched' between two pieces of glass it is essential that these are carefully cleaned before exposure.

ENLARGING MASK

It is necessary to have some means of holding the paper flat on the enlarging board. The easiest and best method is to use the Ilford Adjustable Enlarging Paper Holder illustrated on page 20. This takes all sizes of paper up to 8 × 10 in. and gives a white border round the print.

PREPARATORY WORK

Before making the enlargement, the negative should be carefully spotted to remove all transparent spots and markings, as small defects



The Ilford Adjustable Enlarging Paper Holder.

which may pass almost unnoticed in a contact print will probably disfigure an enlargement and necessitate considerable afterwork on the final result.

Also see that lens and condenser are free from dust by wiping over with a camel-hair brush, chamois leather, or soft linen cloth.

PREPARING THE NEGATIVE FOR PRINTING

The use of panchromatic materials has greatly reduced the necessity for retouching, but there are occasions when hand work on the negative will considerably improve its printing quality.

It is not proposed here to deal exhaustively with the subject, but merely to show how spots and other blemishes on the negative can be dealt with to save a lot of work at a later stage. There is a whole chapter on retouching the negative in the *Ilford Manual of Photography*, to which readers who require further information are recommended to refer.

For really satisfactory work a retouching desk is necessary. An Ilford Junior or No. 8 Darkroom Lamp used with a diffusing panel of opal glass as illustrated opposite, makes an ideal desk for retouching.

SPOTTING. Clear spots can be filled in with black water-colour paint, applied with a No. 0 or No. 1 sable brush. The brush is first moistened

and revolved in the paint until a very fine point is obtained. The negative is then touched with the tip of the brush at the required spot, the brush being held almost at right angles to the surface. Tiny spots can be filled in with one application, but larger spots will require several touches, each being allowed to dry before adding the next.

SCRATCHES. Transparent lines such as scratches can be filled in with a finely pointed 'B' or 'HB' pencil, pressing lightly until the surrounding density is matched. Loose pencil leads for use in a holder are obtainable, which should be sharpened to the finest point on emery or glass paper.

As the smooth surface of the negative may be repellent to pencil, a coating of retouching medium is applied to the part of parts to be retouched, by means of a piece of chamois leather. Care should be taken to thin out the medium round the edges which might otherwise interfere with the density of the negative and result in patchiness in printing. If retouching medium is not available, turpentine is an efficient substitute. Just a smear should be applied on a silk handkerchief to the part to be retouched.



Using an Ilford Junior Darkroom Lamp as a negative retouching desk.

BLACK SPOTS. Black spots require the use of a sharp-pointed retouching knife, and unless the worker is very experienced it is recommended that these be dealt with by spotting-in the resulting white marks on the print, using the technique given on page 33.

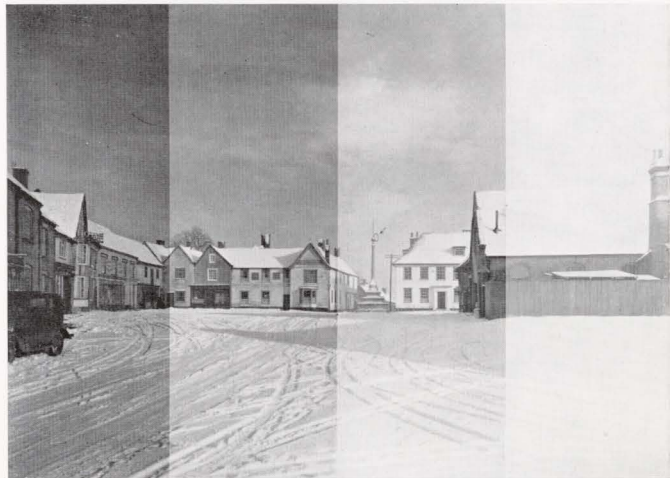
EXPOSING

Exposure in enlarging is dependent on two basic factors, the speed of the paper and the illumination intensity at the paper surface. This latter is governed by the density of the negative, the power and type of illuminant, the degree of enlargement and the aperture of the lens, all except the negative density being controllable as required.

A great deal of inconvenience can be saved by sorting negatives into three classes according to contrasts, using the chart on pages 26 and 27 for easy classification. This procedure makes for order in the darkroom.

Having inserted the negative in the carrier, with the emulsion side towards the lens, the exposure can be ascertained by making a trial exposure strip by the following method.

A sheet of the paper to be used is cut into strips and one strip laid across the image on the masking frame or paper holder. Place the strip to include typical parts of the picture, including both highlights and shadows.



A typical test strip for determining correct exposure. Photograph by A.F. KERSTING, AIBP, FRPS.

As shown in the illustration, the strip of paper is exposed in regular steps; for instance, 2, 4, 8 and 16 seconds. Expose the whole strip for 2 seconds; switch off the light and cover one-quarter of the paper with a piece of opaque card. Expose the uncovered three-quarters for a further 2 seconds and again switch off the light. Now move the card to cover one-half of the paper and expose the uncovered half for a further 4 seconds. Lastly, move the card to cover three-quarters of the strip and expose the last quarter for a further 8 seconds. The strip has now received four different exposures, namely, 2, 4, 8 and 16 seconds.

The strip is then developed in the recommended developer for the recommended time, and after a visual comparison of the four results in white light, the correct exposure can be easily assessed.

DEVELOPING, FIXING AND WASHING

These processes are carried out in exactly the same way as for contact printing, using dishes big enough to accommodate the paper. For big enlargements which are only required occasionally the dishes need only be a few inches longer than the narrow dimension of the paper, and the operations carried out by the 'see-saw' method. If the bath is used for washing big enlargements, and it is ideal for the purpose, don't have it too full of water. Fit the bath waste with an ordinary laboratory open-ended sink pipe, in which $\frac{1}{4}$ -inch holes have been drilled all round at about 3 in. from the bottom. This will ensure a reasonable level of water and will avoid the danger of injuring the paper base when taking the enlargements out of the water. Big, single weight enlargements are susceptible to 'water creases' if taken out of the bath with a large volume of water on top of them. Having only a sufficiency of water in the bath and removing the prints so that the water spills off them will avoid this danger.



Enlarging with Multigrade



As already explained, Multigrade is a variable-contrast enlarging paper, the contrast of which is adjusted by using the appropriate yellow Multigrade filter. These filters are packed in sets of three, made from varnished gelatin film mounted in convenient cardboard holders, and packed in a cardboard case. They should be ordered as Ilford Filters for Multigrade Paper (cardboard mounted). The palest yellow filter is labelled Low Contrast, the next Medium Contrast, and the deepest High Contrast. In use, the filter is held in the beam of light from the enlarger, near to the lens.

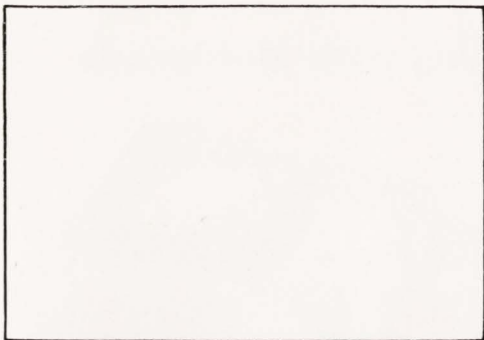
Multigrade filters are of high optical quality and successive exposures may be made through them without risk of displacing the image.

DARKROOM ILLUMINATION

The darkroom must be lighted with care. Use Ilford S Safelight, No. 902 (light brown) for the darkroom lamp and Ilford Filter No. 205 (red) for the enlarger cap. Avoid scattered light from the enlarger and from any other source, such as an incompletely fitting negative mask.

[continued on page 28]

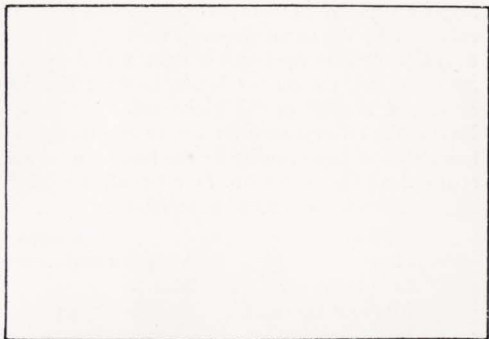
CHART FOR COMPARING NEGATIVE CONTRAST. Compare the contrast of your own negatives with the reproductions in the second row by holding the negative in such a way that it is viewed by reflected light from the blank squares. Whichever



HARD

NORMAL

contrast it most nearly matches will print best on the grade of Ilford Contact, Bromide or Plastika Paper shown beneath the corresponding illustration in the bottom row. Refer to page 12, 'Suiting the Paper to the Negative'.



SOFT

TRYING OUT THE PAPER FOR THE FIRST TIME

Select a negative of medium contrast and place it in the carrier of the enlarger. By the usual test-strip method, and with the Medium Contrast filter held in the beam of light, find the exposure required to give approximately the correct density in the middle tones of the print when developed in PFP or PQ Universal, for 2 minutes at 68°F. (20°C.). Now make an exposure for the time already determined on each of four sheets of paper, using for the first no filter and for the others each of the three filters in turn. Develop all the prints for the same time. The results will be somewhat as follows:

<i>Filter</i>	<i>Appearance of print</i>
None	Very flat and somewhat too heavy
Low Contrast	Flat
Medium Contrast	Satisfactory in contrast and density
High Contrast	Hard and somewhat too light

Should the assessment of the negative have been misplaced, the most satisfactory print will be with one of the other filters, Low or High Contrast.

NORMAL PRINTING TECHNIQUE

The experiment just described serves to demonstrate how Multigrade Paper behaves. In the ordinary way, only one sheet of paper will need to be exposed, using the filter judged appropriate to the negative in question. If the result is not quite satisfactory at the first attempt, a suitable change of filter will be made for the corrected print and, at the same time, allowance for the increased or decreased light absorption of the new filter will be included in any exposure adjustment found necessary. Relative to that for the Medium Contrast filter, the exposures for the other filters are as shown in the following table:

<i>Filter</i>	<i>Exposure time</i>
None	$\frac{1}{2}$
Low Contrast	$\frac{2}{3}$
Medium Contrast	1
High Contrast	$1\frac{1}{2}$

These figures apply to enlargers fitted with tungsten lamps.

METHODS FOR FINER CONTROL

MIXED LIGHT TECHNIQUE. Still finer control of contrast can be obtained with Multigrade by using mixed light with exposure partly through the High Contrast filter and partly without any filter at all. The following is a suggestion for doing this. First make test strip prints

How Multigrade works



**NO
FILTER**



**LOW
CONTRAST
FILTER**



**MEDIUM
CONTRAST
FILTER**



**HIGH
CONTRAST
FILTER**



without a filter to find the time needed to print the middle tones of the negative to correct depth. Then use the following table to allot the times of the filtered and unfiltered portions of the subsequent mixed light exposure. The unit of time in the table is one-tenth of the time required to make the test print already mentioned.

<i>Relative times of exposure</i>		<i>Apparent contrast of the paper</i>
<i>No filter</i>	<i>High contrast filter</i>	
10	0	Very soft
8	6	Soft
6	12	Soft to medium
4	18	Medium
2	24	Medium to hard
0	30	Hard

The High Contrast filter (cardboard mounted) is obtainable separately for this technique.

RING FILTER IN THE ENLARGER LENS. A convenient method of applying the principle described in the last paragraph is to use a ring filter in the lens of the enlarger.

For this, the user should cut a hole in the centre of a circle of the standard High Contrast filter. The hole should be equal in diameter to the smallest aperture of the lens. The filter should then be inserted between the lens components so that it lies close to the diaphragm. With the lens fully stopped down, the light used in enlarging will thus be unfiltered. As the aperture is opened, more and more of the light reaching the easel will be modified by the filter. A small amount of experimental work with the enlarger so fitted will provide the necessary information to make a working chart showing the contrast resulting from each aperture setting. Circles of the High Contrast filter (unmounted) are obtainable for this technique.

If exposures with a filter cut as described above are too long, the central hole can be made somewhat larger, at the expense of some loss of contrast control at the high-contrast end of the scale.

LOCAL CONTROL OF CONTRAST. Some subjects comprise two distinct regions of brightness and result in negatives which are often very difficult to print. For example, landscape negatives frequently contain an area of cloud and sky which is dense and hard, while the rendering of foreground detail is both thin and soft. When such a negative is printed to sufficient depth to record the clouds, the foreground is already so heavily exposed as to obscure most of the detail. The common way of printing negatives of this kind is by some method of local shading, but with Multigrade it is possible to obtain better results by combining this with a slight variant of the mixed light technique just

described, thus making allowance for the difference in contrast between the thin and the dense areas of the negatives.

First of all, the complete sheet of paper is exposed through the High Contrast filter to such an extent that the foreground is of correct depth; this exposure is then followed by a white light (unfiltered) exposure of the sky only, during which further printing of the foreground is prevented by local shading. If the contrast of the sky is not sufficient to warrant using Multigrade at its softest, the Low Contrast filter can be employed for the second exposure if desired.

HOW TO DEAL WITH EXTREMELY SOFT AND EXTREMELY HARD NEGATIVES. A certain amount of control is possible in development. Short development times lead to slightly *increased* contrast and long development times to slightly *decreased* contrast. This behaviour, which is the reverse of experience with normal enlarging papers, results from the special nature of the Multigrade emulsion. Hence, for printing from very thin or other very low contrast negatives, use the High Contrast filter, give rather full exposure and restrict development to about $1\frac{1}{2}$ minutes at 68°F. (20°C.). For very contrasty negatives give rather short exposure without a filter, and prolong development to about 3 minutes.

ILLUMINANT

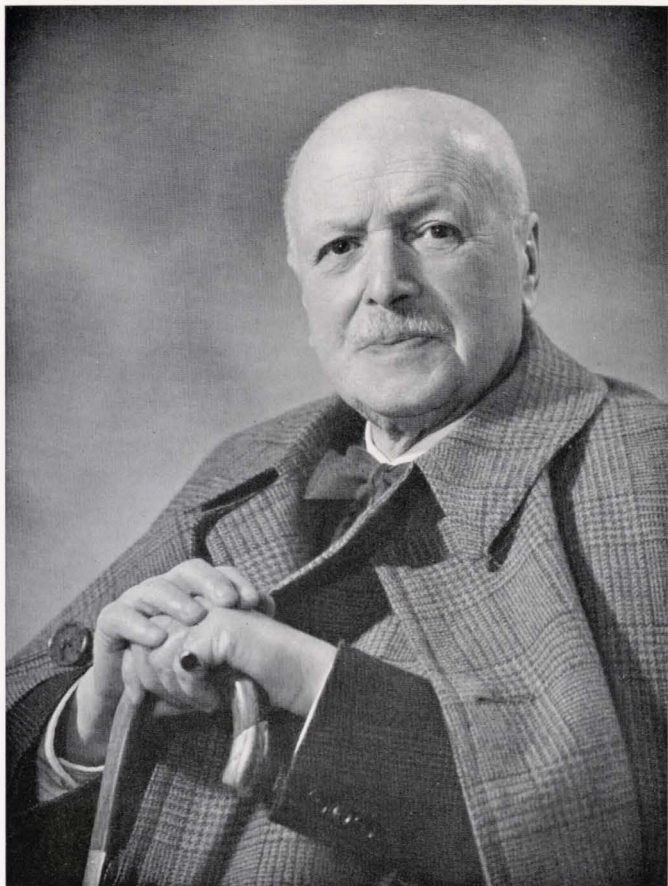
Multigrade paper is intended to be used with tungsten filament lamps. It will also, however, work with *white* cold cathode light, but the exposure times are then much more influenced by the filters, (the exposure factors are approximately $\frac{1}{3}$ for the Low Contrast, 1 for the Medium Contrast and about 3 for the High Contrast filter) and may prove rather long in some circumstances. Except with the High Contrast filter, which gives similar results with both forms of illumination, contrast when using cold cathode light is lower than with tungsten light.

MAINTENANCE OF FILTERS

Keep the filters free from dust. Use a soft camel-hair brush for dusting so as to avoid scratching. The filters may be gently wiped with a *damp* soft cloth; be careful not to allow droplets of water to form on the surface. If any filter is abraded to such an extent that image quality suffers it should be discarded. Individual replacement filters can be purchased.

MULTIGRADE FILTER SUPPORT

A special support is available for holding Multigrade filters below the lens of the enlarger. This leaves both hands free for control in enlarging. The support is adjustable to suit most vertical enlargers having a tubular column.



The late Sir Thomas Jaffrey, Bt. Photograph by R. GORDON WILSON, FRPS.

Finishing the Enlargement

If the negative has been prepared for printing as suggested on page 20, and lens, condenser, negative, etc., have been dusted before use, no extensive handwork on the enlargement will be necessary. Spots, however, crop up occasionally in spite of preventive measures, and so it is well to know how to deal with them when they arise.

For white spots which are generally caused by dust, a No. 1 or No. 2 sable-hair brush and water-colour paint of good quality to match the colour of the print are necessary. The colour must be of fairly stiff consistency and the brush revolved in it until a very fine point is obtained. The colour is then gently applied to the centre of the spot and worked outwards to match the surrounding area using a 'stipple' technique. Most surfaces will take the paint successfully, but where greasiness is present the application of a little pumice powder on cotton wool will get over this difficulty.

With glossy surfaces, and also those with a slight sheen, it is necessary to add a trace of gum to the colour to make it adhere to the print surface or to use the set of Ilford Glossy Retouching Colours.

Black spots require different treatment. They must be removed with a sharply pointed retouching knife. The knife should be held almost vertically and the surface gently scraped a little at a time taking care not to remove the emulsion. After the spot has been taken out the affected area is matched in with water-colour in the same way as for white spots.

Don't attempt 'knifing' a good print before you have had a little practice. Try your hand on a discarded print and get accustomed to handling the knife.

TRIMMING

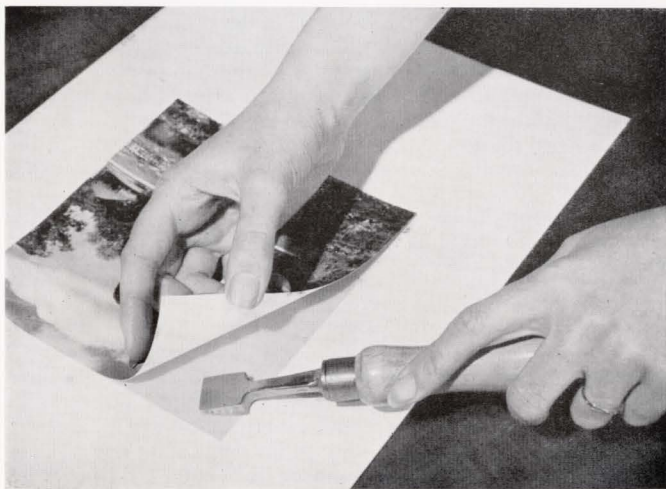
Trimming is most satisfactorily done by means of a desk or guillotine trimmer, but the print may also be trimmed by laying it face upwards on a sheet of glass and cutting it with a sharp penknife or razor blade, guided by a straight edge; or a glass cutting shape of the size required is placed in position on the print, and the edges cut away. Due regard should be paid to the composition of the picture.

MOUNTING

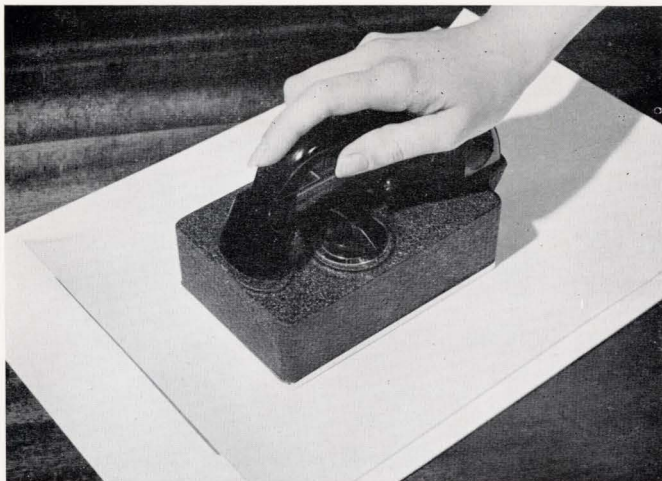
The dry-mounting process, using adhesive shellac tissue, is to be preferred, as with this method there is no cockling of the mount. A piece of tissue, slightly larger than the print, is placed over the back of the print and 'touched down' with a heated fixing iron (a spoon or similar article, for instance) here and there, just sufficient to hold it in position. The tissue will adhere readily if the heat is correct, but if the fixing iron is too hot the tissue will scorch and lose its adhesive properties.

The print, with tissue attached, is now trimmed carefully to the required size and is ready for touching down to the mount. Place the print in the correct position on the mount, and while held firmly, lift one corner (without lifting the tissue) and again 'touch down' the tissue, this time on to the mount. Repeat with each of the corners in turn.

It is now necessary to apply pressure and heat to the print to melt the shellac in the tissue and make it adhere to both print and mount. It is unlikely that the ordinary worker will have a proper dry-mounting press installed, but an ordinary gas or electrically heated flat iron can be used quite successfully. A piece of thin, smooth paper should be



'Touching down' the print to the mount with a heated fixing iron.



Using an electrically-heated dry mounting iron for attaching the print to the mount. Note the protective sheet of paper between the iron and the print.

interposed between iron and print and the iron pressed fairly heavily on to successive portions of the print until the whole is adhering. The temperature of the iron is important. Beginners should experiment with a few waste prints first in order to get some idea of the heat required before attempting to mount an important print. A temperature of 140° – 150° F. is recommended; if the iron is too hot the print may be scorched and show burn marks; if too cold it will not melt the tissue.

Where dry-mounting is impracticable it is quite satisfactory to use ordinary mountant, starch paste, or rubber solution. This should be rubbed well in to the back of the print, which is then mounted on thin card with very little border. Dry under pressure, trim the edges, and mount on the final mount by what is called 'tipping-in'. This is done by applying an adhesive (such as Seccotine or rubber solution) to the top edge only and pressing well into contact.



Preparation of the Exhibition Print

CONTROL IN ENLARGING

It is possible to exercise a large measure of control in enlarging. Whether it is desirable has been debated for many years, and it is not within our province to side either way. One school argues that a photograph should depict a fact, whether interesting or otherwise, depending on the 'seeing eye' of the photographer. The other school contends that the photographer is entitled by manipulation or control to transform the factual representation to conform more closely to his aesthetic ideas or tastes. However, control is possible, and our purpose is to illustrate the procedure.

Control in its simplest form is the printing up of certain parts of the enlargement by means of increased exposure or the holding back of other parts by means of masks which locally decrease exposure.

The top illustration opposite shows a straight print in which the shadows are lacking in detail, and the clouds, because the sky portion is too dense, have not printed through.

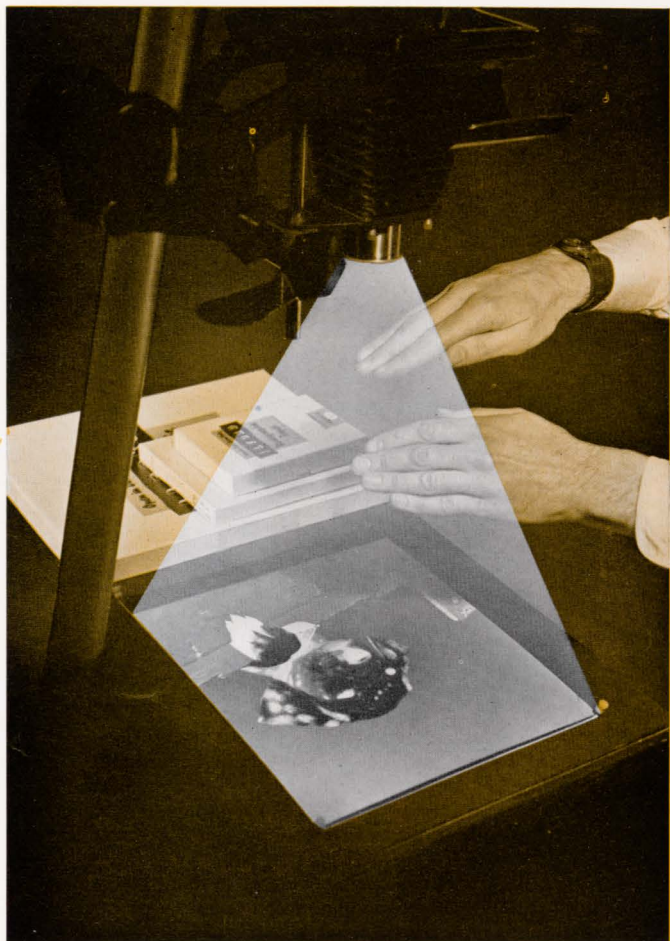
The second illustration shows the effect of control, and it will be seen that considerable improvement has been made, firstly by bringing out the shadow detail, secondly by showing the cloud formation, and thirdly by accentuating the effect of distance. The following notes and illustrations will explain the method of procedure.

(1) SHADOW DETAIL. The print was exposed for the full time with the exception of the shadow areas, which were held back for part of the time by means of 'dodgers', *i.e.*, opaque cards cut to shape and attached to wire handles. The dodgers were held from between two to three inches above the print and slowly moved about over the shadow portion of the print.

(2) CLOUDS. A hole, approximating in shape to the sky portion, was torn in a piece of black paper which was interposed between lens and image, and additional exposure given for the sky area.

(3) DISTANCE. After dealing with the above, extra exposure was given to the foreground, the remainder of the image being covered by an opaque card.

The amount of additional exposure required for (2) and (3) can only be ascertained by trial and error until the judgment is sufficiently good to estimate the strength of the various negative densities.



Showing the hands being used for local shading during enlarging.

IMPORTANT NOTE

When using 'dodgers' for shading and other devices for printing up, see that they are moved about slightly during exposure as otherwise a hard outline will be formed which will ruin the picture. In the absence of 'dodgers', the hands and fingers can be used to produce a variety of shapes and answer admirably for the purpose, but keep the hands away from the lens to prevent condensation which will give rise to unsharpness.

PORTRAITS

Portrait subjects rarely require such elaborate treatment, but where conflicting or distracting areas occur they can be darkened or lightened as required by holding back or giving additional exposure to the parts concerned. Awkward highlights in the background may present some difficulty but may be overcome by additional exposure made through a hole in the centre of a piece of card. The card is held between lens and paper, the shape of the hole coinciding with the area to receive extra exposure. In extreme cases a small hand torch fitted with a paper cone can be used to project a small beam of light on to the paper and fogging the area concerned.

Portraits can often be improved by the 'Dark Vignette' method which, by darkening the corners of the print, concentrates the attention to the important part. This method requires the use of a mask cut roughly from a piece of opaque paper to the shape of the image. The whole of the negative is first exposed in the normal way and afterwards additional exposure as required is given with the image portion shielded by the mask.

Slight diffusion of the image is most attractive, particularly with portraits of women, and this may be obtained by using a chiffon diffuser. This useful device is made by cutting a hole or square in a piece of cardboard and fastening over it a piece of dark chiffon. This is held close up to the lens during about two-thirds of the full exposure, and the remainder of the exposure completed with the lens uncovered. The period of diffusion is largely governed by the degree of enlargement; small magnification needs a longer period and larger magnification a shorter period. Chiffon also has the property of reducing any 'grainy' effect of the image.

Combination Printing

The two small illustrations, from separate negatives, have been combined during enlarging to make the pleasing picture below. Notice that the careful choice of cloudscape harmonizes with, and accentuates the serenity of the winter scene.

The method of achieving such delightful combinations is described in this chapter.



Combination Printing

Many landscape pictures are spoiled either by the total absence of clouds, or by cloud formations which do not harmonise with the general composition of the foreground. Such pictures can often be considerably improved by adding a suitable cloudscape from another negative.

The experienced pictorial worker is aware of the great possibilities in this process and usually has a collection of cloud negatives of both spectacular and subdued formations. So whenever you notice an interesting cloudscape, photograph it; you will certainly find a use for it. (See illustrations on pages 42 and 43 showing interesting cloud formations.)

MAKING CLOUD NEGATIVES

Iford Selochrome plates or films with an Alpha filter are recommended for all cloud pictures except sunsets, for which panchromatic material without a filter is preferable because of its red sensitivity. It is advisable to include a portion of the landscape and to aim for a fairly thin negative, full of detail. Over-exposure, therefore, should be avoided and development reduced to about two-thirds of the normal time. As a rough guide, a bright cumulus cloud in summer would require 1/100th sec. at $f/22$ on Selochrome with an Alpha filter. If plates are used they should be backed and a lens hood is always essential.

Before selecting the cloud negative to be printed the following important factors should be borne in mind: the clouds must be lit from the same direction as the foreground; diffused foreground lighting implies hazy or fleecy clouds; strong foreground lighting should never be combined with the corona effect produced when the sun is obscured by billowing clouds; in other words avoid any semblance of incongruity.

PROCEDURE

First make sure that the sky portion of the landscape negative is sufficiently dense to prevent it printing through during foreground exposure. If not, it may be shielded locally with the hand.

Place the landscape negative in the enlarger and focus the image to the required size. Use an old piece of paper to focus on and, finally,

Some typical



cloud effects



secure the paper holder to the enlarging board. Cut into strips one sheet of the paper to be used and expose one strip placed across a typical part of the image. After development, fixing, and rinsing, this strip is examined in white light and the correct exposure assessed. Now make a straight exposure on a full size sheet of paper to ascertain what control is necessary to make the final print. After this information has been obtained from an inspection of the 'test' print, it should be washed and blotted off, as it has a further function to perform, namely, to act as a focusing surface upon which, at a later stage, the cloud image is placed. A second full print is now made, again on a full-size sheet of paper, carrying out all the control which was found necessary on the first enlargement. Very often an essential part of this control consists of shielding the sky area to keep it 'clean' and ready to receive the clouds. Being satisfied that the control is perfect, proceed to expose (but *not* develop). Mark the print on the back with the letter 'T' for top immediately after exposing to prevent confusion as to the right way up when adding the clouds. The landscape negative is now removed from the enlarger and is replaced by the chosen cloud negative, which is focused on to the first (damp) test print. Place the image with great care and again fix the paper holder. The damp enlargement is then removed and a test strip exposed over a typical part of the cloud image. This is developed under the same conditions as the landscape test, and the sky exposure assessed.

The exposed landscape print is now placed in the paper holder, and the exposure made, shielding the part occupied by the landscape with a sheet of cardboard. The exact horizon lines can be indicated by marks made previously on the paper holder. Care must be taken to see that the cardboard shield is held about one inch from the paper and is moved slightly to avoid a hard line. The finished print will indicate whether any control of the clouds is necessary, as it sometimes happens that the top of the cloud portion requires more exposure than the lower part. If this is the case another sheet of paper should be exposed, first to the landscape negative and then to the clouds, using whatever extra control is necessary. Errors may occur in this shielding, resulting in a 'halo' effect on the horizon. This is remedied by allowing the lower parts of the cloud to overlap the landscape. It is seldom necessary to shield parts of the landscape which protrude into the sky unless they are of a light tone. As a general rule clouds can be printed over trees, as the trees are usually the darkest portions of the picture, although much can be done by 'placing' the cloud negative so that a light portion comes over the light objects.

Presentation

This last phase in print production is more important than is generally realised. Beautiful composition and technical excellence may be marred by insufficient attention to the details of paper surface, border space, print position, and the display and character of the title. Every one of these details should be directed towards enhancing the composition and general atmosphere of the picture so that the whole work is in complete harmony.

CHOOSING THE PRINTING PAPER

Before making the final enlargement, choose a paper, both from the point of view of base colour and surface texture, which will help to convey the character of the picture. Refer to the list of papers on pages 8 and 9, and to the album of specimens in the pocket at the back of the book.

As an average guide, it may be accepted that cream papers naturally give the impression of warmth and friendliness; qualities which may be further emphasised by toning. Similarly, a white base may be used to simulate coldness and delicacy.

Surface texture can also be made to play a big part in preserving the character of a picture. Smooth surfaces should be chosen where delicate detail or tonal values are present, while rougher surfaces should be used to accentuate ruggedness or mass effects.

CHOOSING THE MOUNT

Mounts should be of the same colour as the enlarging paper, but of a slightly paler tint; *e.g.*, cream paper, pale cream mount; white paper, white mount. A smooth paper appears best on a smooth mount, and *vice versa*.

POSITIONING THE PICTURE

It is impossible to lay down any rigid rules for positioning the picture on the mount, since this is very largely an expression of personal taste, but certain generally accepted principles will serve as a guide.

The print should never be placed exactly midway between the top and bottom edges of the mount. There should always be more space below the print than above it as otherwise it will appear to be too near



Photograph by JOHN ADAMS, AIBP.

the bottom of the mount. 'Equal borders top and sides and double the top at bottom', is a good maxim to work to. Equally satisfactory are the proportions: Top, $1\frac{1}{2}$; Sides, 1; Bottom, 2.

Borders either side should usually be equal except where off-centre display helps the composition of the picture; in which case, the titling should be off-centre to oppose and balance this effect.

Square prints should usually be mounted more above vertical centre than upright prints.

Landscape shaped prints may be mounted either on horizontal or vertical mounts, remembering that a vertical mount appears to confine the sides of the picture more than a horizontal mount.

Finally, personal judgment may be strengthened by studying mounting styles in art dealers' windows and at pictorial exhibitions of all kinds.

BORDER TINTS

A common and very effective practice is to interpose a tinted surround between the picture and the mount. This border tint is a sheet of tissue, darker than the mount and lighter than the general image colour, which is trimmed slightly larger than the picture area. Its purpose is to lessen the contrast between the picture and the mount, but it should never be so obtrusive as to detract attention from the picture itself.

An alternative border may be made by drawing a thin pencil line all round the edge of the print. The space between this line and the print will vary with the subject and style of mounting.

PLATE-MARKING

A plate-marked border is a slightly sunken area surrounding the print, which is very distinctive for some types of picture.

If some means of applying fairly heavy pressure is available, such as a dry mounting press, old-fashioned letterpress, or even a mangle, it is worth making a plate-marking device to the following pattern.

Two sheets of thin, tough card are required, the size of the mount to be plate marked. From one sheet, cut away with a sharp razor blade an area rather larger than the print size in use, and in the position the print will occupy on the mount. The inner section is removed and trimmed very slightly smaller ($\frac{1}{32}$ in.) on all four sides, and glued firmly to the second large sheet in such a position that it fits snugly into the aperture of the top card when the two are laid together. Finally, the two cards are hinged loosely (so that the mount will lie comfortably between them) using a length of linen adhesive tape.

To plate-mark the mount, insert it into the hinged folder and apply pressure.

TITLING

It is often desirable to add a title to the picture, not only because it provides a finishing touch, but also because it can help to convey to the viewer the mood which actuated the photographer during its production. It follows, then, that the title must satisfy certain requirements. It must be apt and to the point and as brief as possible; it must be well drawn and carefully positioned.

Very careful thought should be given to the choice of title. Avoid platitudes and bald statements of self-evident fact; try to match the mood of the title with that of the picture – as an extreme example, never use a humorous title on a serious subject; aim at originality, but where this fails, poetic or prose quotations are often effective.

DRAWING THE TITLE

A certain amount of practice is necessary to the production of satisfactory lettering, but results will more than justify the effort. The following hints, however, will help to minimise the tediousness of trial and error.

- 1 Always rule guide lines for lettering; small letters should be about one-third to one-half the height of capitals.
- 2 All lettering should be 'roughed out' lightly before filling-in is attempted.
- 3 When drawing upright letters make certain that they are really upright.
- 4 Italics should lean at an angle of about 75° . Guide lines at this angle should be drawn faintly to keep the slope constant.
- 5 Spacing of letters is important; equal spacing of capitals is not ideal, *e.g.*, 'open' letters like A, F, J, L, T, require less spacing than the more 'solid' letters M, B, D, etc.
- 6 Round capitals like C, G, O, should encroach very slightly over the guide lines to overcome the illusion of smallness.
- 7 A long title appears more legible in capitals and small letters than when written entirely in capitals.
- 8 Solid lettering gives weight and stability.
- 9 Outlined lettering gives delicacy and lightness.
- 10 Italics suggest movement and rhythm.
- 11 The thick and thin strokes in round hand or script writing are best obtained by using a 'chisel' point to the pencil or by lettering pens, which are obtainable in various sizes.

Styles of lettering will vary according to the type of picture, the taste of the worker, and his ability, but several representative and easily drawn styles are illustrated opposite.

Titles need not always appear beneath the enlargement; they are sometimes very effective when drawn inside the picture area, but this practice should be used with caution and discretion.

A B C D E F G H I J K L M

N O P Q R S T U V W X Y

Z

An alphabet built entirely of compass curves and ruled lines. Divide the height of the letters into four equal parts and use the compass point on these guide lines for describing all the curves.

Aa, Bb, Cc, Dd, Ee, Ff, Gg.

Hh, Ii, Jj, Kk, Ll, Mm, Nn.

Oo, Pp, Qq, Rr, Ss, Tt, Uu.

Vv, Ww, Xx, Yy, Zz.

This alphabet is easily mastered and should be drawn with a pencil sharpened to a chisel point or with special round hand lettering pens. The flat surface of the pen or pencil should be held at about 45 degrees to the guide lines, thus ensuring an even thickness to all down strokes.

A free-hand alphabet which may be varied to give full scope to individual expression of style.

A B C D E F G H I J K L M N

O P Q R S T U V W X Y Z

Another alphabet whose curves are drawn with a compass, but in this case the height of the letters is divided into three equal parts.

Aa, Bb, Cc, Dd, Ee, Ff, Gg, Hh, Ii.

Jj, Kk, Ll, Mm, Nn, Oo, Pp, Qq.

Rr, Ss, Tt, Uu, Vv, Ww, Xx, Yy, Zz.

A free-hand italic alphabet. It is important that the slope remains constant throughout and guide lines should be ruled at regular intervals at an angle of about 75 degrees or 80 degrees, using a template placed on the base line.

Recommended Developers for Ilford Papers

PFP DEVELOPER

A Phenidone-hydroquinone developer for use with enlarging and contact papers. PFP is packed in powder form to make up a concentrated stock solution which is diluted to twice its volume for the development of enlarging papers. For contact papers the stock solution is used undiluted. PFP is also suitable for use with films and plates.

PQ UNIVERSAL DEVELOPER

A concentrated liquid developer made to a Phenidone (Regd.) hydroquinone formula which is recommended for use with papers and also with films and plates. It contains no metol or caustic alkali, and there is less tendency to stains on fingers and clothes and a much greater freedom from dermatitis. Supplied as a concentrated stock solution which should be diluted as follows:

Enlarging Papers	}	add 1 part to 9 parts water.
Films and Plates (dish)		
Contact Papers		add 1 part to 5 parts water.
Films and Plates (tank)		add 1 part to 19 parts water.

Recommended Fixers for Ilford Papers

IF-2 ACID HYPO FIXING SALTS

An acid fixing solution suitable for use with all materials. Supplied in powder form.

HYPAM FIXER AND HARDENER

A rapid Ilford fixing solution containing ammonium thiosulphate, supplied in a highly concentrated liquid form. Using Hypam, papers are fixed in about 30 seconds. For use, one part of the stock solution is diluted to four times its volume.

When hardening of the emulsion is also required, Hypam Hardener should be added to the Hypam Fixer in the proportion of 1 oz. to every 40 oz. of prepared fixer and the materials immersed for from 3 to 5 minutes.

N.B.—Hypam Hardener should be used only with Hypam Fixer — never alone, or with other fixing baths.

Weights and Measures

WEIGHTS

BRITISH AVOIRDUPOIS UNITS

1 dram	= 27·4 grains
16 drams	= 1 ounce
$\frac{1}{4}$ ounce	= 109 grains
$\frac{1}{2}$ ounce	= 219 grains
1 ounce	= 437·5 grains
16 ounces	= 1 pound
1 pound	= 7000 grains

METRIC UNITS

1000 milligrams	= 1 gram
1000 grams	= 1 kilogram

MEASURES

IMPERIAL LIQUID UNITS

1 fluid dram	= 60 minims
8 fluid drams	= 1 fluid ounce
1 fluid ounce	= 480 minims
20 fluid ounces	= 1 pint
2 pints	= 1 quart
4 quarts	= 1 Imp. gallon
1 Imp. gallon	= 160 fluid ounces
(1 fluid ounce of water weighs 1 ounce)	
1 gallon of water weighs 10 pound	
1 cubic foot of water weighs 62·27 lb.)	

METRIC UNITS

1 cubic cm.	= 1 millilitre
1000 cubic cm.	= 1 litre

CONVERSION RATIOS BETWEEN BRITISH AND METRIC UNITS

WEIGHTS

1 grain	= 64·8 milligrams
1 dram	= 1·77 grams
1 ounce	= 28·4 grams
1 pound	= 453·6 grams
1 gram	= 15·43 grains
	= 5·6432 drams
	= 0·0352 ounces

MEASURES

1 fluid dram	= 3·55 cubic cm.
1 fluid ounce	= 28·4 cubic cm.
1 pint	= 568·2 cubic cm.
1 gallon	= 4·546 litres
1 cubic cm.	= 16·9 minims
	= 0·282 fluid drams
	= 0·0353 fluid oz.
1 litre	= 35 $\frac{1}{4}$ fluid ounces
	(approx.)

AMERICAN MEASURES

In the U.S.A. fluid measure is different.

1 fluid ounce	= 29·6 cubic cm.
1 pint	= 16 fluid ounces = 473·1 cubic cm.
1 gallon	= 128 fluid ounces = 3·785 litres

Temperature Scales

To convert Centigrade to Fahrenheit: multiply by $\frac{9}{5}$ and then add 32.

To convert Fahrenheit to Centigrade: subtract 32 and then multiply by $\frac{5}{9}$.

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Printed in England

SPECIMEN SURFACES OF

ILFORD

**Bromide • Plastika • Contact
and Multigrade Papers**

ILFORD PLASTIKA

ILFORD CONTACT

ILFORD BROMIDE

ILFORD MULTIGRADE

Surface	Weight	Contrast Grades		
		1 Soft	2 Normal	3 Hard
White Glossy	S.W D.W	A1. A1.K	A2. A2.K	A3. A3.K
White Stipple	D.W	E1.K	E2.K	E3.K
Grained Half Matt ...	D.W	F1.K	F2.K	F3.K
White Rayon	D.W	G1.K	G2.K	G3.K
Cream Grained Half Matt	D.W	T1.K	T2.K	T3.K
Glossy	S.W	C1.IP	C2.IP	C3.IP
		2 Normal	3 Hard	4 Extra Hard
Glossy	S.W D.W	B2. IP B2. 1K	B3. IP B3. 1K	B4. IP B4. 1K
Semi Matt	D.W	B2.24K	B3.24K	B4.24K
Velvet Stipple	S.W D.W	B2.26P B2.26K	B3.26P B3.26K	B4.26P B4.26K
Rough Lustre	D.W	B2.33K	B3.33K	—
Glossy	S.W D.W	MG.IP MG.1K MG.26K		
Velvet Stipple	D.W			

Made in England

ILFORD

B2.24K

BROMIDE

SEMI MATT



ILFORD

B2.26K

BROMIDE

VELVET STIPPLE



I L F O R D

MG.1K

MULTIGRADE

GLOSSY

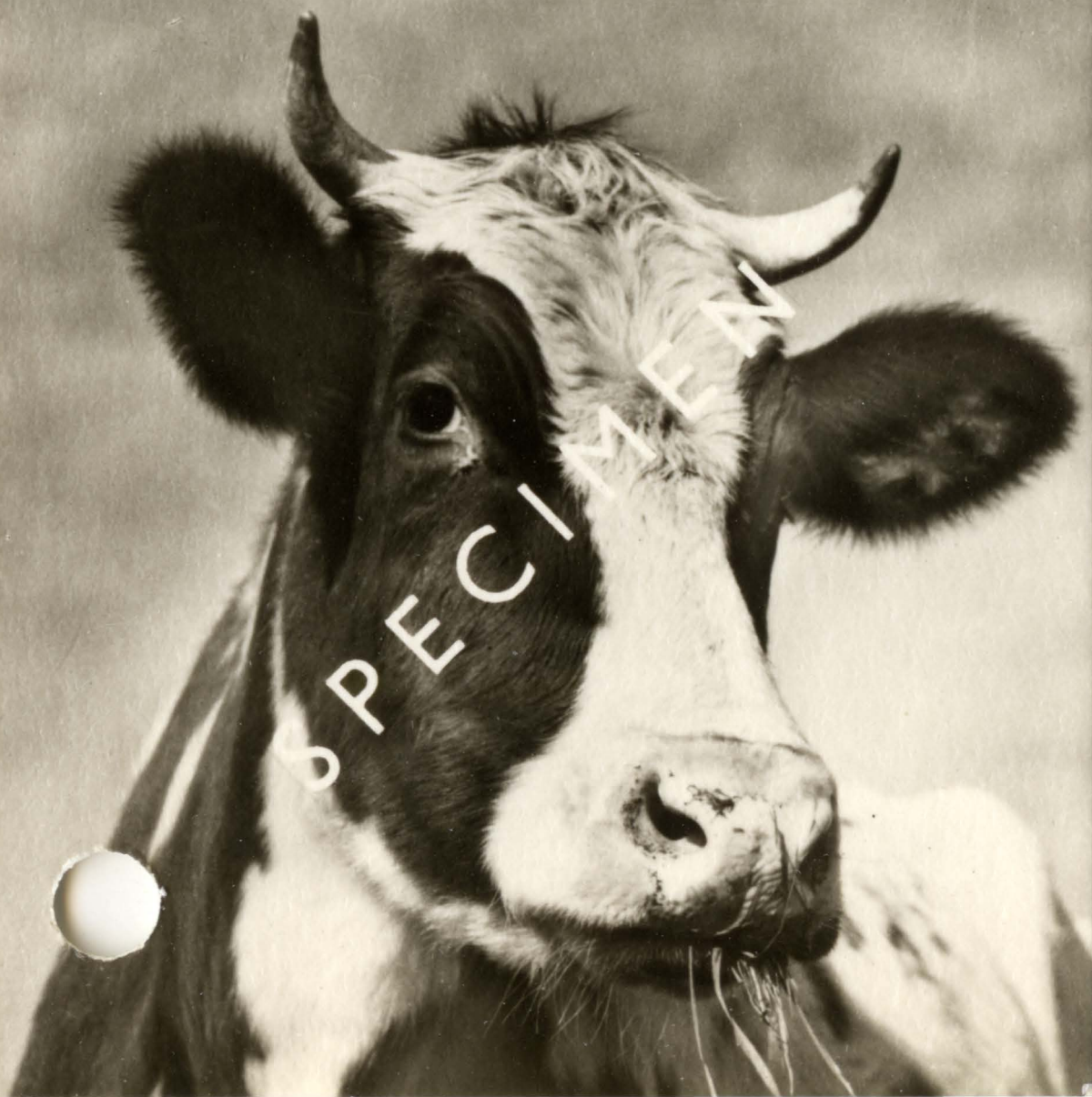


ILFORD

B2.33K

BROMIDE

ROUGH LUSTRE



ILFORD

B2.1P

BROMIDE

GLOSSY



ILFORD

MG.26K

MULTIGRADE

VELVET STIPPLE

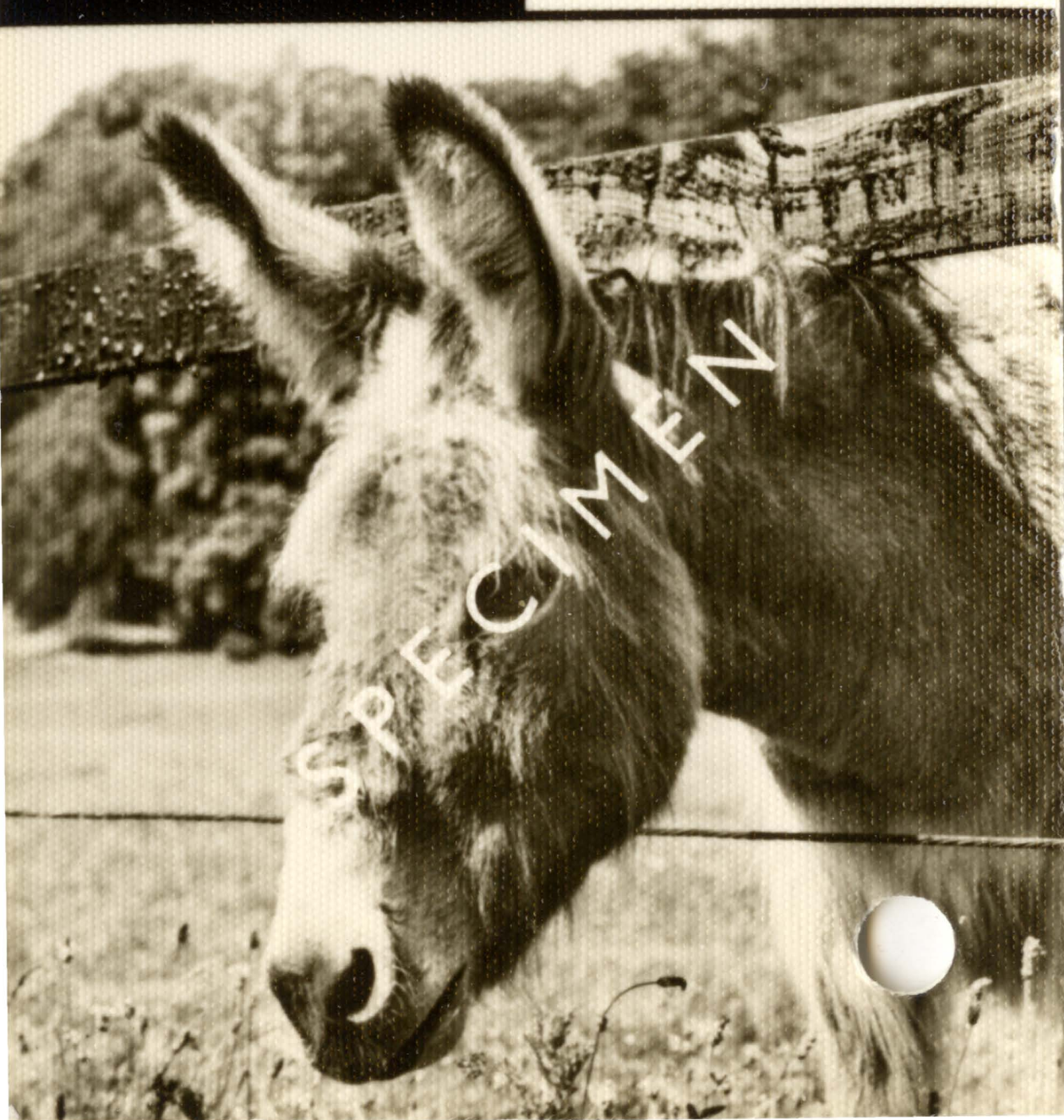


ILFORD

G.2K

PLASTIKA

WHITE RAYON



ILFORD

F.2K

PLASTIKA

GRAINED
HALF MATT



ILFORD

A.2

PLASTIKA

WHITE GLOSSY



ILFORD

E.2K

PLASTIKA

WHITE STIPPLE



ILFORD

T.2K

PLASTIKA

**CREAM GRAINED
HALF MATT**

